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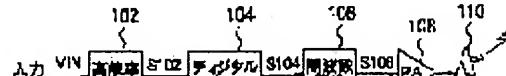
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(54) VIDEO DATA TRANSMITTER, VIDEO DATA RECEIVER AND VIDEO DATA TRANSMISSION SYSTEM USING THE SAME

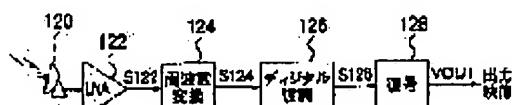
(57) Abstract:

PURPOSE: To provide a video data transmission system or the like capable of letting a user transmit video data by a suitable transmission method corresponding to the use and the purpose of video signals.



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CONSTITUTION: Corresponding to the use and the purpose of input video data VIN, this video data transmitter 10 once records the input video data VIN to be the object of editing work after demodulation for instance, then generates the transmission signals of a non-real-time transmission rate by compression-encoding them by low compressibility or generates real-time transmission signals by compression-encoding the input video data VIN of the on-the-spot relay of sports for instance by high compressibility and transmits them through a satellite communication channel to this video data receiver 12.



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CLAIMS

[Claim(s)]

[Claim 1]A picture-image-data sending set comprising:

A compression means which carries out compression encoding of the incompressible picture image data by a predetermined method, and generates the 1st compression video data of real time data speed corresponding to said incompressible picture image data.

The 1st record reproduction means that records said compression video data, reproduces said recorded compression video data with said real time data speed and different data speed, and generates the 2nd compression video data.

A selecting means which chooses said 1st compression video data or said 2nd compression video data according to a switch signal, and is outputted as a selection signal.

A picture-image-data transmitting means which transmits Reed-Solomon coding and an encoding means which convolutional-code-izes and generates a transmission signal, and said transmission signal for said selection signal.

[Claim 2]The picture-image-data sending set comprising according to claim 1:

A digital modulation means to generate a transmission signal which said picture-image-data transmitting means carries out digital modulation of the carrier signal with access speed according to data speed of said 1st compression video data contained in said transmission signal, or said 2nd compression video data, and suits a predetermined communication line.

A transmitting means which transmits said transmission signal to said communication line.

[Claim 3]The picture-image-data sending set according to claim 1 or 2 which compresses said incompressible picture image data with a compression ratio in which a case where said compression means is recorded on said record reproduction means differs from a case where it does not record on said record reproduction means.

[Claim 4]A picture-image-data receiving set comprising:

The 1st compression video data of real time data speed which carried out compression encoding of the incompressible picture image data by a predetermined method, Or a picture-image-data reception means which receives Reed-Solomon coding and a convolutional-code-ized transmission signal including the 2nd compression video data of said real time data speed and different data speed.

A decoding means which reed-solomon-decodes, and collapses and decodes said received transmission signal.

The 2nd record reproduction means that records said 2nd compression video data contained in said said decoded transmission signal, and is reproduced with predetermined data speed. An expansion means which elongates said 2nd reproduction compressed data reproduced with said 1st compression video data or said predetermined data speed contained in said transmission signal.

[Claim 5]The picture-image-data receiving set comprising according to claim 4:

A reception means in which said transmission signal conforms to a predetermined communication line, it is transmitted to the picture-image-data receiving set concerned via this communication line, and said picture-image-data reception means receives said transmission signal from said communication line.

A digital demodulation means which carries out digital demodulation of the transmission signal with access speed according to said 1st compression video data contained in said transmission signal which said reception means received, or said 2nd compression video data.

[Claim 6]The picture-image-data receiving set according to claim 4 or 5 in which it is compressed into with a different compression ratio from said 1st compression video data and said 2nd compression video data, and said expansion means elongates these by a method according to a compression ratio of said 1st compression video data or said 2nd compression video data.

[Claim 7]An image data transmission system comprising:

The picture-image-data sending set according to claim 3.

The picture-image-data receiving set according to claim 6.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the picture-image-data receiving set used for transmission of picture image data by which compression encoding was carried out, a picture-image-data sending set, and the image data transmission system using these.

[0002]

[Description of the Prior Art] For example, in the video signal transmission system which transmits a video signal to a broadcasting station from the coverage spot of news via a satellite communication line, analog FM modulation of the video signal is carried out, and transmission is performed with the signal speed (real time speed) of the video signal at the time of photography as it is. Drawing 5 is a figure showing the composition of the conventional video-signal sending set 80. Drawing 6 is a figure showing the composition of the conventional video-signal receiving set 90. As shown in drawing 5, the video-signal receiving set 90, Carry out FM modulation of the inputted video signal VIN inputted from the outside by FM modulation circuit 82, and it is considered as the modulating signal S82 of an intermediate frequency band, It changes into the transmission signal S84 of the frequency which suits a satellite communication line by the frequency changing circuit (up converter) 84, power amplification is carried out by the power amplification circuit 86, and it transmits via the transmission antenna 88.

[0003] On the other hand, the video-signal receiving set 90 receives a transmission signal from a satellite communication line via the receiving antenna 92, It amplifies by the low noise amplifying circuit 94, and changes into an intermediate frequency band by the frequency changing circuit (down converter) 94, and it gets over by FM demodulator circuit 98, and outputs as the output video signal VOUT corresponding to the original inputted video signal VIN.

[0004]

[Problem(s) to be Solved by the Invention] The video-signal sending set 80 and the video-signal receiving set 90 which were mentioned above as conventional technology, Since a video signal is transmitted in real time, it cannot respond to the request of liking to carry out high-speed transmission of the image recorded at the news coverage spot, for example using the camcorder/movie etc. in order to fully secure the editing processing time by the televising time of news. On the other hand, since the image of sport play-by-play broadcasting does not usually need to perform an editing process in a hurry, there is no necessity for such high-speed transmission.

[0005]This invention is made in view of the problem of the conventional technology mentioned above, and is a thing.

The purpose is to provide the picture-image-data sending set which can shorten substantially the time which transmission of a high news-materials image takes to **, a picture-image-data receiving set, and the image data transmission system using these.

An object of this invention is to provide the picture-image-data sending set to which not only the above-mentioned high-speed transmission but a user can transmit a video signal with a suitable compression ratio and transmission method according to the use and the purpose of a video signal, a picture-image-data receiving set, and the image data transmission system using these.

[0006]

[Means for Solving the Problem] To achieve the above objects, a picture-image-data sending set concerning this invention is provided with the following.

A compression means which carries out compression encoding of the incompressible picture image data by a predetermined method, and generates the 1st compression video data of real time data speed corresponding to said incompressible picture image data.

The 1st record reproduction means that records said compression video data, reproduces said recorded compression video data with said real time data speed and different data speed, and generates the 2nd compression video data.

A selecting means which chooses said 1st compression video data or said 2nd compression video data according to a switch signal, and is outputted as a selection signal.

A picture-image-data transmitting means which transmits Reed-Solomon coding and an encoding means which convolutional-code-izes and generates a transmission signal, and said transmission signal for said selection signal.

[0007]Said picture-image-data transmitting means carries out digital modulation of the carrier signal suitably with access speed according to data speed of said 1st compression video data contained in said transmission signal, or said 2nd compression video data, It has a digital

modulation means to generate a transmission signal which suits a predetermined communication line, and a transmitting means which transmits said transmission signal to said communication line. Suitably, said compression means compresses said incompressible picture image data with a compression ratio in which a case where it records on said record reproduction means differs from a case where it does not record on said record reproduction means.

[0008]A picture-image-data receiving set concerning this invention is provided with the following.

The 1st compression video data of real time data speed which carried out compression encoding of the incompressible picture image data by a predetermined method, Or a picture-image-data reception means which receives Reed-Solomon coding and a convolutional-code-ized transmission signal including the 2nd compression video data of said real time data speed and different data speed.

A decoding means which reed-solomon-decodes, and collapses and decodes said received transmission signal.

The 2nd record reproduction means that records said 2nd compression video data contained in said said decoded transmission signal, and is reproduced with predetermined data speed. An expansion means which elongates said 2nd reproduction compressed data reproduced with said 1st compression video data or said predetermined data speed contained in said transmission signal.

[0009]Suitably, said transmission signal conforms to a predetermined communication line, and it is transmitted to the picture-image-data receiving set concerned via this communication line, and said picture-image-data reception means, A digital demodulation means which carries out digital demodulation of the transmission signal with access speed according to said 1st compression video data contained in said transmission signal which a reception means which receives said transmission signal, and said reception means received from said communication line, or said 2nd compression video data. It is suitably compressed with a different compression ratio from said 1st compression video data and said 2nd compression video data, and said expansion means elongates these by a method according to a compression ratio of said 1st compression video data or said 2nd compression video data.

[0010]An image data transmission system concerning this invention is provided with the following.

A picture-image-data receiving set concerning this invention of one of the above.
A picture-image-data sending set concerning this invention of one of the above which suits this picture-image-data receiving set.

[0011]

[Function]In the picture-image-data sending set concerning this invention, a compression means compresses picture image data with a high compression ratio, when compressing picture image data with a low compression ratio in compressing the picture image data of which the high quality corresponding to image editing processing is required, for example, and compressing the picture image data of which high quality in particular is not required. It reproduces with the data speed (real time data speed) which can acquire the image of the same speed as the original video signal, and different data speed, and the 1st record reproduction means generates the 2nd picture image data, when the picture image data compressed, for example with the low compression ratio is recorded and the recorded picture-image-data signal is restored. A selecting means chooses said 1st compression video data or the 2nd compression video data according to a switch signal, and outputs it as a selection signal. an encoding means -- said selection signal -- Reed-Solomon coding -- and it convolutional-code-izes and a transmission signal is generated. A picture-image-data transmitting means transmits the 1st picture image data of the above, or the 2nd picture image data to a communication line as a transmission signal according to the data speed of ** and others.

[0012]The picture-image-data receiving set concerning this invention is a device which receives the transmission signal which the picture-image-data sending set concerning above-mentioned this invention transmitted, and outputs the original picture image data, and a picture-image-data reception means, The transmission signal containing the 1st compression video data of the above or the 2nd compression video data is received from a communication line by the method according to these data. It reed-solomon-decodes, and collapses and a decoding means decodes said received transmission signal. The 2nd record reproduction means is reproduced with predetermined data speed suitable for the editing device which records said 2nd compression video data contained in the decoded transmission signal, for example, is connected to the picture-image-data receiving set concerned. An expansion means performs elongation processing according to a compression ratio to said 1st compression video data or said 2nd compression video data, and supplies it to the apparatus connected to the picture-image-data receiving set concerned.

[0013]

[Example 1] Hereafter, the 1st example of this invention is described. Drawing 1 is a figure showing the composition of the picture-image-data sending set 10 concerning this invention in the 1st example. Drawing 2 is a figure showing the composition of the picture-image-data receiving set 12 concerning this invention in the 1st example. As shown in Drawing 1, the picture-image-data sending set 10 comprises the highly efficient coding equipment 102, the digital modulation circuit 104, the frequency changing circuit 106, the power amplification

circuit (PA) 108, and the transmission antenna 110.

High efficiency coding of the input video data VIN of a digital format is carried out, a transmission signal is generated, and this transmission signal is transmitted to a satellite communication line.

[0014]As shown in drawing 2, the picture-image-data receiving set 12 comprises the receiving antenna 120, the low noise amplifying circuit (LNA) 122, the frequency changing circuit 124, the digital demodulation circuit 126, and the decoder circuit 128.

The transmission signal which the picture-image-data sending set 10 has transmitted via a satellite communication line is received, It decodes, output video data VOUT corresponding to the original input video data VIN is generated, and this output video data VOUT is supplied to a video editing device or a recorder connected to the picture-image-data receiving set 12.

[0015]Hereafter, operation of the picture-image-data sending set 10 and the picture-image-data receiving set 12 is explained. High efficiency coding of the input video data VOUT inputted into the picture-image-data sending set 10 is carried out by the highly efficient coding equipment 102, and it is outputted to the digital modulation circuit 104 as the encoded video data S102. The digital modulation circuit 104 carries out digital modulation of the encoded video data S102, and outputs it to the frequency changing circuit 106 as the modulating signal S104 of an intermediate frequency band.

[0016]The frequency changing circuit (up converter) 106 changes the modulating signal S104 into the frequency which suited the satellite communication line, and outputs it to the power amplification circuit 108 as the transmission signal S106. The power amplification circuit 108 carries out power amplification of the transmission signal S106 to a predetermined transmission output, and transmits to a satellite communication line via the transmission antenna 110. The transmission signal which the picture-image-data sending set 10 transmitted is transmitted to the picture-image-data receiving set 12 via a communications satellite (not shown).

[0017]The low noise amplifying circuit 122 of the picture-image-data receiving set 12 amplifies the transmission signal from the picture-image-data sending set 10 which won popularity via the receiving antenna 120, and outputs it to the frequency changing circuit 124 as the input signal S122. The frequency changing circuit (down converter) 124 changes an input signal into the input signal S124 of an intermediate frequency band, and outputs it to the digital demodulation circuit 126.

[0018]The digital demodulation circuit 126 restores to the input signal S124 by the method corresponding to the digital modulation circuit 104 of the picture-image-data sending set 10, generates the demodulation signal S126, and outputs it to the decoder circuit 128. The

decoder circuit 128 decodes the demodulation signal S126, and supplies it to external apparatus as output video data VOUT corresponding to the original input video data VIN. By using the image data transmission system using the picture-image-data sending set 10 and the picture-image-data receiving set 12 which were explained above, picture image data can be transmitted using a satellite communication line.

[0019]

[Example 2] Hereafter, the 2nd example of this invention is described. In the image data transmission system using the picture-image-data sending set 10 (drawing 1) and the picture-image-data receiving set 12 (drawing 2) which were shown in the 1st example, From the restrictions of the working speed of the decoder circuit 128 of the highly efficient coding equipment 102 of the picture-image-data sending set 10, and the picture-image-data receiving set 12 which perform coding and decoding of the picture image data of the high sampling frequency for broadcasting service. The transmission signal could be transmitted only with the data speed (real time data speed) which can acquire the image of the speed actually same after decoding as the image of the original picture image data, for example, the demand of liking to transmit the compression video data recorded on the recording and reproducing device to a broadcasting station at the coverage spot for a short time was not able to be met.

[0020]In the image data transmission system using the picture-image-data sending set 10 and the picture-image-data receiving set 12, the compression ratio of high efficiency coding becomes settled with the bandwidth of the satellite communication line which can be used for transmission of a transmission signal. Therefore, when the picture image data which is not fit for high compression rate coding is coded and transmitted with the high compression ratio according to the bandwidth of the satellite communication line, the problem of the quality of the image after decoding deteriorating arises.

[0021]Since the image quality deterioration accompanying editing processing is further added when performing an editing process to the picture image data after decoding, there is a request that he would like to transmit picture image data from the photography spot by the method that a quality image is acquired after decoding. However, in transmission of the picture image data in the real time data speed using the picture-image-data sending set 10 and the picture-image-data receiving set 12, such a request cannot be met from restriction of the zone of a satellite communication line. The image data transmission system using the picture-image-data sending set 20 and the picture-image-data receiving set 22 which are shown below is for solving the problem of the image data transmission system which comprises the picture-image-data sending set 10 and the picture-image-data receiving set 12, and responding to the above-mentioned request.

[0022] Drawing 3 is a figure showing the composition of the picture-image-data sending set 20 in the 2nd example. Drawing 4 is a figure showing the composition of the picture-image-data

receiving set 22 in the 2nd example. What attached the same numerals as each component part of the picture-image-data sending set 10 shown in drawing 1 among each component part of the picture-image-data sending set 20 shown in drawing 3 is the same, What attached the same numerals as each component part of the picture-image-data receiving set 12 shown in drawing 1 among each component part of the picture-image-data receiving set 22 shown in drawing 4 is the same.

[0023]As shown in drawing 3, the picture-image-data sending set 20 comprises the highly efficient coding equipment 200, the data selection circuit (SEL) 202, the data accumulation device 204, the error correcting code additional circuit 206, the digital modulation circuit 208, the control circuit 210, and the sending set 14. The sending set 14 comprises the frequency changing circuit 106, the power amplification circuit 108, and the transmission antenna 110, carries out high efficiency coding of the input video data VIN which is the target of transmission by the method according to its purpose and use, generates a sending signal, and transmits on a satellite communication line.

[0024]As shown in drawing 4, the picture-image-data receiving set 22 comprises the receiving set 16, the digital demodulation circuit 220, the error correction circuit 222, the data accumulation device 224, the data selection circuit (SEL) 226, the decoding device 228, and the control circuit 230, The receiving set 16 comprises the receiving antenna 120, the low noise amplifying circuit 122, and the frequency changing circuit 124, The transmission signal sent via a satellite communication line from the picture-image-data sending set 20 is received, a transmission signal is restored to it and decoded by the method according to the access speed and compression ratio, and apparatus, such as an external video editing device, is provided with output video data VOUT corresponding to the original input video data VIN.

[0025]The highly efficient coding equipment 200 of the picture-image-data sending set 20, According to control through the control signal C200 of the control circuit 210 according to the purpose and use of the input video data VIN, change a compression ratio, and compression encoding of the input video data VIN is carried out, It outputs to the data selection circuit 202 and the data accumulation device 204, respectively as the compression video data S200a and S200b.

[0026]The data accumulation device 204 records the compression video data S200b inputted from the highly efficient coding equipment 200, for example on recording media, such as a magneto-optical disc and a hard disk, according to control of the control circuit 210 through the control signal C204. The data accumulation device 204 reproduces the recorded video signal with different access speed from real time data speed according to control of the control circuit 210, and outputs it as the compression video data S204 to the data selection circuit 202.

[0027]The data selection circuit 202 chooses the inputted compression video data S200a and either of S204 according to control of the control circuit 210 through the control signal C202

(switch signal), and outputs them as the compression video data S202 (selection signal) to the error correcting code additional circuit 206. The data selection circuit 202 chooses the compression video data S200a, when the input video data VIN is not the target of an editing process, and when the input video data VIN is not the target of an editing process, specifically, it chooses the compression video data S204, for example.

[0028]According to control of the control circuit 210 through the control signal C206, Reed-Solomon coding is performed to the compression video data S202, and it collapses further, it codes, and the error correcting code additional circuit 206 is outputted to the digital modulation circuit 208 as the transmission signal S206. According to control of the control circuit 210 through the control signal C208, digital modulation of the transmission signal S206 is carried out with the modulating method according to the access speed, and the digital modulation circuit 208 outputs it to the sending set 14 as the modulating signal S208 of an intermediate frequency band.

[0029]The sending set 14 changes the modulating signal S208 into the transmission signal which suited the satellite communication line, and transmits on a satellite communication line. The transmission signal transmitted from the sending set 14 is relayed by the communications satellite (not shown), and turns into an input signal of the picture-image-data sending set 20. The receiving set 16 of the picture-image-data receiving set 22 receives a transmission signal from a satellite communication line, and outputs it to the digital demodulation circuit 220 as the input signal S124.

[0030]According to control of the control circuit 230 through the control signal C220, digital demodulation of the input signal S124 is carried out by the method according to the access speed, and the digital demodulation circuit 220 outputs it to the error correction circuit 222 as the demodulation signal S220. It is also possible not to follow control of the control circuit 230, but for digital demodulation circuit 220 the very thing to identify the access speed of a transmission signal, and for it to be made to perform the recovery according to the identified access speed.

[0031]According to control of the control circuit 230 through the control signal C222, the error correction circuit 222, An error correction is performed to the demodulation signal S220, and it decodes by the method corresponding to the error correcting code additional circuit 206 of the picture-image-data sending set 20, and outputs to the data selection circuit 226 and the data accumulation device 224 as the compression video data S222.

[0032]The data accumulation device 224 the control signal C224 according to control of the passed control circuit 230 The compression video data S222. (The compression video data specifically transmitted with non-real time access speed from the picture-image-data sending set 20) is recorded, and the recorded compression video data is read at real time speed, and is outputted to the data selection circuit 226 as the compression video data S224.

[0033]The data selection circuit 226 chooses either of the compression video datas S222,224 according to control of the control circuit 230 through the control signal C226, and outputs it to the decoding device 228 as the compression video data S226. The decoding device 228 performs elongation processing by the method according to the compression ratio of the compression video data S226, and supplies output video data VOUT corresponding to the original input video data VIN to the apparatus connected outside.

[0034]Hereafter, operation of the picture-image-data sending set 20 and the picture-image-data receiving set 22 is explained. According to the use and the purpose of the input video data VIN, the picture-image-data sending set 20, after becoming a quality image after decoding carries out compression encoding of the input video data VIN demanded (for example, it is the target of an editing process after a recovery) with a low compression ratio (the quantity of the compression video data after compression increases -- as), it records once, and a non-real time transmission signal is generated.

[0035]becoming a quality image after decoding carries out compression encoding (the quantity of the compression video data after compression decreases -- as) of the input video data (for example, play-by-play broadcasting of a sport) VIN which is not demanded with a high compression ratio, and the picture-image-data sending set 20 generates a real time transmission signal. The picture-image-data sending set 20 transmits either of these transmission signals via a satellite communication line to the picture-image-data receiving set 22.

[0036]The picture-image-data receiving set 22 receives the transmission signal from the picture-image-data sending set 20, and carries out digital demodulation according to the access speed of a transmission signal. The picture-image-data receiving set 22 decodes a transmission signal by the method according to the compression ratio. That is, once becoming a quality image after decoding records the transmission signal corresponding to the input video data VIN demanded, the picture-image-data receiving set 22 is reproduced and decoded at real time speed, and is supplied to editing equipment etc. On the other hand, without becoming a quality image after decoding recording the transmission signal corresponding to the input video data VIN which is not demanded, it decodes in real time and the picture-image-data receiving set 22 is outputted.

[0037]As stated above, according to the image data transmission system concerning this invention using the picture-image-data sending set 20 and the picture-image-data receiving set 22. When transmitting picture image data at real time speed, it becomes possible by setting up appropriately each component part of the picture-image-data sending set 20 to transmit picture image data only by the time lag of the sum of internal delay of the picture-image-data sending set 20 and the picture-image-data receiving set 22 and the transit delay on a communication line.

[0038]When transmitting picture image data at non-real time speed, By recording the picture image data after compressing into a data accumulation device one by one, once reproducing the recorded data with non-real time access speed, and generating a transmission signal, For example, it is possible to transmit the picture image data coded with arbitrary compression ratios with the access speed which suited the transmission capacity of transmission lines, such as a satellite communication line, to the picture-image-data receiving set 22 side. Non-real time speed transmission of high-speed transmission etc. is attained [as a result] to obtain output video data VOUT of the same speed as the original input video data by the picture-image-data receiving set 22 by once reproducing it with real time access speed, after recording the input signal after a recovery on a data accumulation device.

[0039]When the image data transmission system applied, for example to this invention is used for transmission of the picture image data for broadcasting service, It adds to the function of the image data transmission system using the picture-image-data sending set 10 and the picture-image-data receiving set 12 which were shown in the 1st example, Transmission of the picture image data of the news-materials image which already needs to hurry the editing process in a broadcasting station by an inclusion settled, etc. can be performed now in a short time compared with the image data transmission system using the picture-image-data sending set 10 and the picture-image-data receiving set 12. Therefore, the convenience of the news video which uses abundantly the combination of a relay image and the image which carried out the editing process as a result can be raised more nearly substantially than before by using it according to the use and the purpose of the input video data VIN, changing these functions.

[0040]Since picture image data can be transmitted with the access speed doubled with the frequency bandwidth of the usable translator when transmitting if the image data transmission system concerning this invention is used for transmission through the translator of the communications satellite, The frequency band which can be used for transmission can be used efficiently.

[0041]According to the image data transmission system concerning this invention, it compares with the decoded image quality of the relay image on condition of an editing process. It can transmit so that the decoded image quality of material video images with a high possibility that image quality will deteriorate by an editing process may become high, and the image quality of the relay image in a broadcast stage and an editing process image can be uniformed as a result.

[0042]The image data transmission system concerning this invention can be used for transmission of the picture image data which used a terrestrial communication line or a wire circuit other than a satellite communication line, etc. The image data transmission system concerning this invention can be used for general transmission of data by which changes the highly efficient coding equipment 102 and the decoding device 228 other than transmission of

picture image data, and compression encoding is carried out.

[0043]Each component of the image data transmission system of this invention does not ask whether it is constituted in hardware, or it is constituted by software, as long as substitution is possible. The picture-image-data sending set of this invention, the picture-image-data receiving set, and the image data transmission system using these were shown in each example mentioned above, and also they can take various composition like the modification shown here, for example.

[0044]

[Effect of the Invention]As stated above, the picture-image-data sending set concerning this invention, a picture-image-data receiving set, and the image data transmission system using these can shorten substantially the time which transmission of a news-materials image with high urgency takes, for example. As for the image data transmission system using the picture-image-data sending set, the picture-image-data receiving set, and these concerning this invention, a user can transmit a video signal with a suitable transmission method according to the use and the purpose of a video signal.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a figure showing the composition of the picture-image-data sending set concerning this invention in the 1st example.

[Drawing 2]Drawing 2 is a figure showing the composition of the picture-image-data receiving set concerning this invention in the 1st example.

[Drawing 3]It is a figure showing the composition of the picture-image-data sending set concerning this invention in the 2nd example.

[Drawing 4]It is a figure showing the composition of the picture-image-data receiving set concerning this invention in the 2nd example.

[Drawing 5]It is a figure showing the composition of the conventional video-signal sending set.

[Drawing 6]It is a figure showing the composition of the conventional video-signal receiving set.

[Description of Notations]

10, 20 -- A picture-image-data sending set, 102,200 -- Highly efficient coding equipment, 104,208 -- A digital modulation circuit, 106 -- A frequency changing circuit, 108 -- Power amplification circuit, 110 -- A transmission antenna, 202,226 -- A data selection circuit, 204,224 -- Data accumulation device, 206 -- An error correcting code additional circuit, 210,230 -- A control circuit, 12, 22 -- Picture-image-data receiving set, 120 [-- A digital demodulation circuit, 128,228 / -- A decoding device, 222 / -- An error correction circuit, 224 / -- A data accumulation device, 14 / -- A sending set, 16 / -- Receiving set] -- A receiving antenna, 122 -- A low noise amplifying circuit, 124 -- A frequency changing circuit, 126,220

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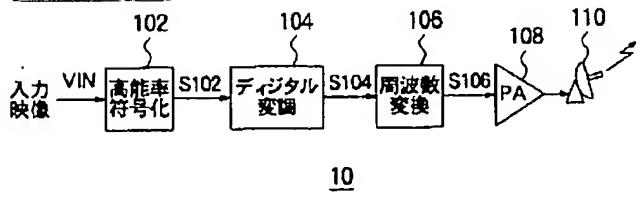
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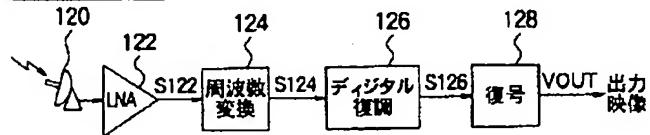
DRAWINGS

[Drawing 1]



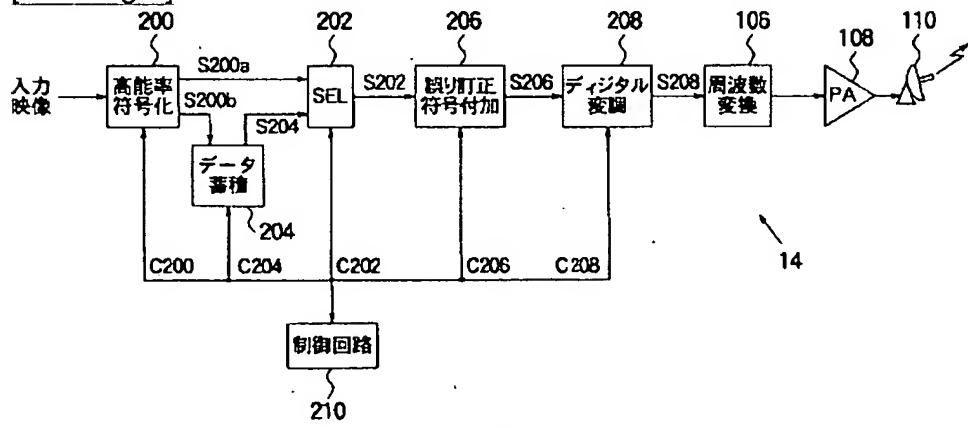
10

[Drawing 2]



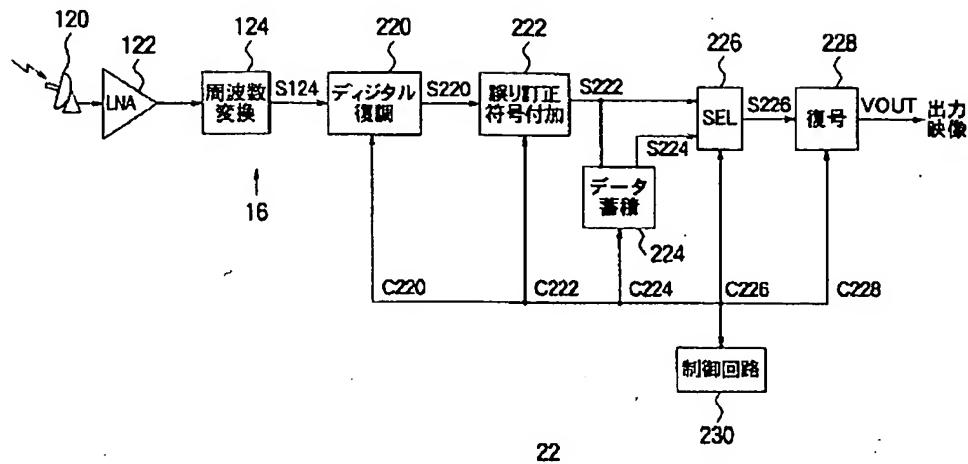
12

[Drawing 3]

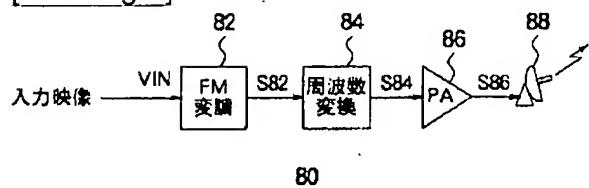


20

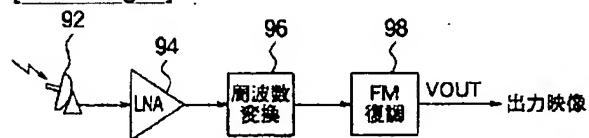
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]